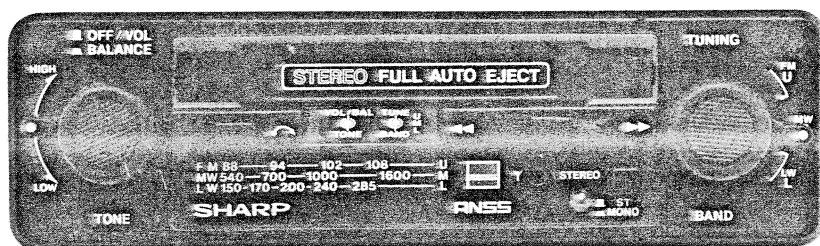




Service Manual

RG-5800H
RG-5800E



Solid State In-dash Type Cassette Car Stereo Player with LW/MW/FM/FM Stereo Radio

MODEL RG-5800H/RG-5800E

"In the interests of user-safety the set should be restored to its original condition and only parts identical to those specified be used."

SPECIFICATIONS

GENERAL

Type Solid State In-dash Type 4-Track 2-channel Full Auto Stop/Auto Eject Cassette Car Stereo Player with built-in LW/MW/FM/FM STEREO 3-band Radio

Power source 12 V (for negative earthing car only)

Output impedance .. 4 ohms/channel

Semiconductors 18-transistor (1-FET), 14 diode (1-LED) and 5-IC (integrated circuit)

Output power 8 + 8 W (maximum power)
5 W + 5 W (at 10% distortion)

S/N 54 dB

Dimensions 178 (W) x 130 (D) x 44 (H) mm

Weight 1.3 kg

TAPE PLAYER SECTION

Playback system ... 4-track, 2-channel Stereo

Using tape Philips standard compact cassette tape

Tape speed 4.75 cm/sec.

Wow and flutter ... 0.3% (DIN 45511)

Frequency response . 50Hz ~ 10kHz/-6dB

Fast forward/Rewind
time 120 seconds (@ C-60 cassette tape)

Motor D.C. motor with mechanical governor

RADIO SECTION

Frequency range ... LW 150 ~ 285kHz
MW 520 ~ 1,620kHz
FM 87.6 ~ 108MHz

IF LW/MW 452kHz
FM 10.7MHz

Sensitivity LW 400μV/20dB
MW 40μV/20dB
FM 2.5μV

SHARP CORPORATION OSAKA, JAPAN

PARTS LAYOUT

- ① Tone Control
- ② Power Switch/Volume Control/Balance Control
- ③ Cassette Ejection/Fast-Forward & Rewind Release Knob
- ④ Cassette Door
- ⑤ Fast-Forward/Rewind Lever
- ⑥ Antenna Trimmer (TC102)
- ⑦ FM Stereo Indicator
- ⑧ FM Stereo/Mono Selector
- ⑨ Tuning Control
- ⑩ Band Selector

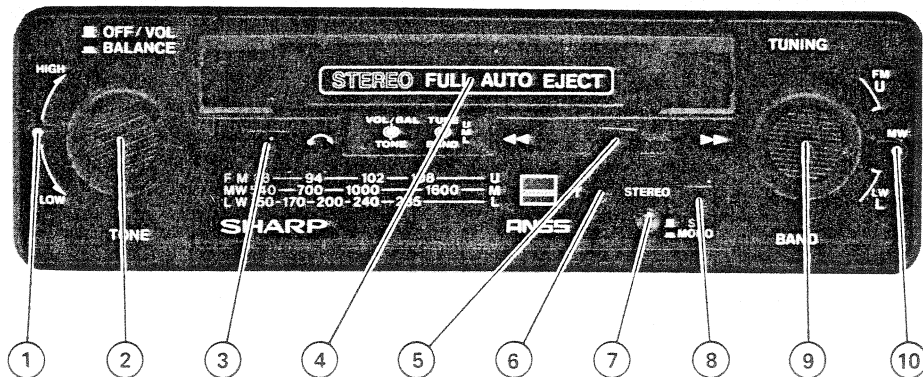


Figure 1 FRONT PARTS LAYOUT

- ⑪ Ground Terminal
- ⑫ Antenna Socket
- ⑬ DIN Socket, 6-pole (RG-5800H only)
- ⑭ DIN Socket, 7-pole (RG-5800H only)
- ⑮ DC Input Socket
- ⑯ Speaker Socket

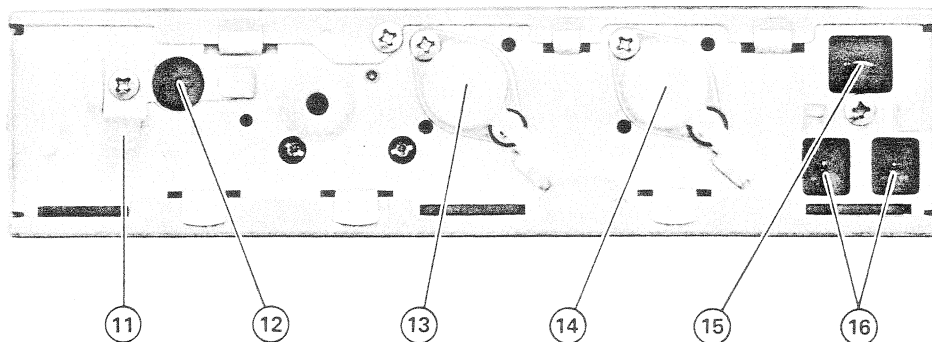


Figure 2 REAR PARTS LAYOUT

Figure 3 BLOCK DIAGRAM

Should it become necessary at any time to check the alignment of this receiver, proceed as follows;

- 2) Set the volume control at maximum.
- 3) Attenuate the signals from the generator enough to swing the most sensitive range of the output meter.
- 4) Use a non-metallic alignment tool.
- 5) Repeat adjustments to insure good results.

Set the band selector switch at "MW" or "LW" position.

STEP	BAND	TEST STAGE	SIGNAL GENERATOR		RECEIVER		ADJUSTMENT
			CONNECTION TO RECEIVER	INPUT SIGNAL FREQUENCY	DIAL SETTING	REMARKS	
1	MW	IF	Connect signal generator through a dummy to the antenna socket. Ground lead to the receiver chassis. (Refer to Figure 4)	Exactly 452kHz (400Hz, 30%, AM modulated)	High end of dial (minimum inductance)	Adjust for maximum output on speaker voice coil lugs.	T103 T104
2	MW	IF	Repeat until no further improvement can be made.				
3	MW	Band Coverage	Same as step 1.	Exactly 515kHz (400Hz, 30%, AM modulated)	Low end of dial (maximum inductance)	Same as step 1.	Adjust the MW oscillator coil L106.
			Same as step 1.	Exactly 1650kHz (400Hz, 30%, AM modulated)	High end of dial (minimum inductance)	Same as step 1.	Adjust the MW oscillator trimmer TC104.
4	MW	Tracking	Same as step 1.	Exactly 1400kHz (400Hz, 30%, AM modulated)	1400kHz.	Same as step 1.	Adjust the MW antenna trimmer TC102, and then adjust the MW RF trimmer TC103.
5	MW		Repeat steps 3 and 4 until no further improvement can be made.				
6	LW	Band Coverage	Same as step 1.	Exactly 145kHz (400Hz, 30%, AM modulated)	Low end of dial (maximum inductance)	Same as step 1.	Adjust the LW oscillator coil L108
			Same as step 1.	Exactly 310kHz (400Hz, 30%, AM modulated)	High end of dial (minimum inductance)	Same as step 1.	Adjust the LW oscillator trimmer TC105
7	LW	Tracking	Same as step 1.	Exactly 160kHz (400Hz, 30%, AM modulated)	160kHz.	Same as step 1.	Adjust the LW antenna trimmer TC101.
			Same as step 1.	Exactly 260kHz (400Hz, 30%, AM modulated)	260kHz.	Same as step 1.	Adjust the LW antenna coil L102, and then adjust the LW RF coil L104.
8	LW		Repeat steps 6 and 7 until no further improvement can be made.				

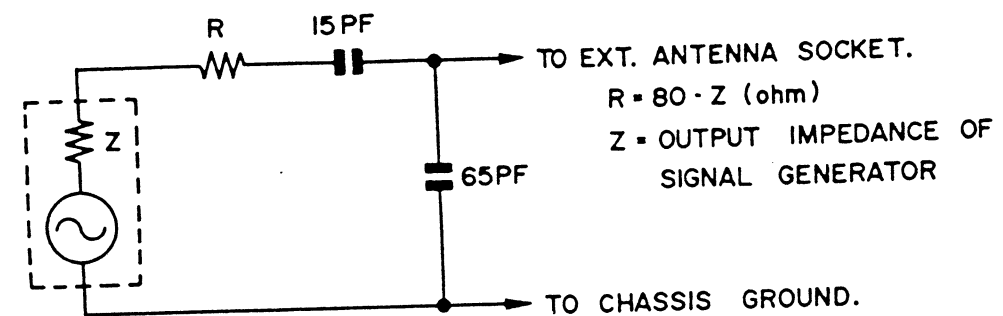


Figure 4 AM DUMMY

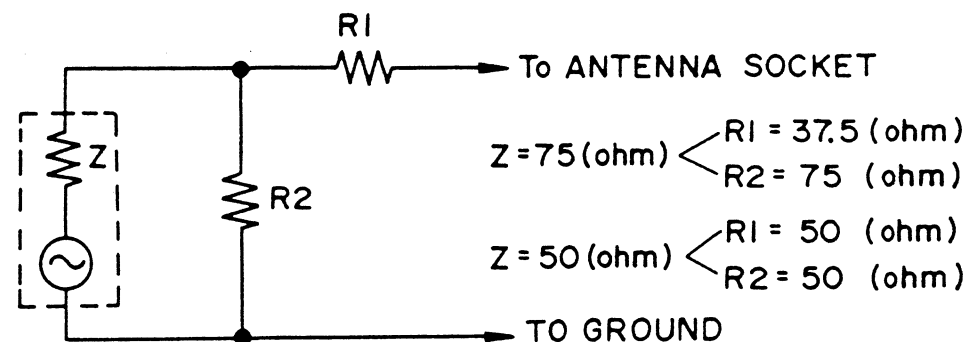
FM ALIGNMENT CHART

Set the band selector switch at "FM" position.

STEP	TEST STAGE	SIGNAL GENERATOR		RECEIVER		ADJUSTMENT
		CONNECTION TO RECEIVER	INPUT SIGNAL FREQUENCY	DIAL SETTING	REMARKS	
1	IF (NOTE B)	Connect signal generator through a .022MFD capacitor to antenna socket (SO101). Connect generator ground lead to the receiver chassis.	Exactly 10.7MHz (400Hz, 30%, FM modulated)	Low end of dial. (maximum inductance)	Connect VTVM between test point TP102 and chassis ground.	Detune T102. Tune T1, and T101.
2	Ratio Detector	Same as step 1.	Exactly 10.7MHz (unmodulated)	Same as step 1.	See NOTE A.	See NOTE A.
3	Repeat steps 1 until no further improvement can be made.					
4	Band Coverage	Connect signal generator through a dummy including output impedance of signal generator to the car antenna socket (SO101). Ground lead of generator connected to the receiver chassis. (Refer to Figure 5)	Exactly 87.2MHz (400Hz, 30%, FM modulated)	Same as step 1.	Adjust for maximum output at speaker voice coil.	Oscillator trimmer TC2
5	Tracking	Same as step 4.	Exactly 88MHz (400Hz, 30%, FM modulated)	88MHz	Same as step 4.	RF trimmer TC1.
6	Repeat steps 4 and 5 until no further improvement can be made.					

NOTE A

- 1) Connect VTVM (0.1 volt range D.C. Scale between test point TP102 and chassis ground. l.
- 2) Adjust T102 for 0 volt on VTVM.
- 3) Change signal generator frequency 10.7MHz + 100kHz and -100kHz approximately.
- 4) Adjust T101 for balanced peaks. Peak separation should be approximately 200kHz.



Z=OUTPUT IMPEDANCE OF SIGNAL GENERATOR

Figure 5 FM DUMMY

NOTE B

Five kinds of ceramic filter (CF101, CF-202) are available for this set. The difference of central frequency from each other can be known by the color indication. The table below shows such a difference of IF and S curve, depending upon the color indications of the ceramic filter (CF101, CF102).

Central Frequency	D	Black	10.64MHz \pm 30kHz
	B	Blue	10.67MHz \pm 30kHz
	A	Red	10.70MHz \pm 30kHz
	C	Orange	10.73MHz \pm 30kHz
	E	White	10.76MHz \pm 30kHz

For their employment, it is required to use two ceramic filters of same type.

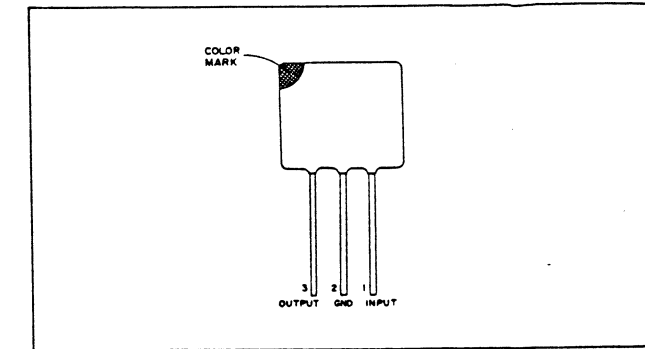


Figure 6

FM STEREO ALIGNMENT

Set the band selector switch at "FM" position and Stereo/mono Selector switch at "STEREO" position.

STEP	SIGNAL GENERATOR		RECEIVER		METER CONNECTION	ADJUSTMENT
	CONNECTION TO RECEIVER	INPUT SIGNAL FREQUENCY	DIAL SETTING	REMARKS		
1			98MHz	Adjust so that the frequency becomes 19.0kHz. (In case an oscilloscope is connected to the test point TP101, adjust the signals to be 19kHz by using Lissajou's wave-form).	Connect the frequency counter (or oscilloscope) through a 100K ohm resistor to TP101 (12 pin of IC103).	VR102

If without the frequency counter, proceed with the alignment as follows. While receiving a FM stereo signal, turn the VR102 until the P.L.L. will be locked (when it is locked, the stereo indicator will be lit). Then, reversely turn the VR102 halfway and fix it.

ANSS ADJUSTMENT

(Pins 1, 6 and 15 described below are of IC102.)

1. Set the band selector switch at "FM" position.
2. Apply a 19 kHz signal of 30 mV to pin 1.
3. Connect a VTVM and/or an oscilloscope to pin 6.
4. Adjust L110 for minimum output at pin 6.
5. Then, apply a 1 kHz signal of 100 mV to pin 1.
6. Make sure that there is no output at pin 6, applying a 100 kHz signal of 50 mV further to pin 15.
7. Next, make sure that a 1 kHz signal of 100 mV appears at pin 6, connecting pin 15 to earthe.

THE INSTRUCTION OF FREQUENCY ADJUSTMENT

In order to comply with Pfg. Nr. 358/1970, please fix the low end of dial frequency (87.5MHz) and the high end of dial frequency (107.9MHz) on FM band, by adjusting oscillation trimmer (TC2) and oscillation coil (L4), respectively, as illustrated in Figure 7.

HEAD AZIMUTH ADJUSTMENT (Refer to Figure 7)

Standard Test Tape to be applied: Philips HU-71512 or the equivalent (TEAC MTT-113, VICTOR VTT-601).

- (1) Set the Player Unit on.
 - (2) Turn the azimuth adjusting screw until the output of the test tape (6.3kHz) is boosted up to the maximum.
- Caution: After completion of the adjustment, be sure to lock the adjusting screw in place, using glyptal or glue.

ANSS (Automatic Noise Suppressor System)

SUMMARY

Electrical interferences generated by combustion engines used in motor-cars are necessary to be suppressed to make listening to FM broadcastings possible. An effective way to suppress interferences produced by its own car and those of others received via the antenna is to apply a kind of noise gating for the output signal of the FM

demodulator. Since the mentioned interferences have a frequency spectrum upto several hundreds of kHz being easily reproduced by the FM demodulator there is sufficient signal available beyond 53kHz to drive this gating circuit. Based upon these principles the ANSS has been developed.

INTRODUCTION

In the FM car radio, pulse noise received via the antenna becomes unpleasant noise that interferes with the happy FM listening, passing the circuits between the antenna and the speaker. The ANSS is a device that can automatically remove such pulse noises from the incoming signals, so only the desired signals will be obtained. Being detected at the FM detector, both the desired signal and pulse noise, caught by the antenna, are superposed each other as shown in Figure 8. Then they are applied to the ANSS circuit where only the desired signal is developed since the noisy one is removed.

The bandwidth of the ANSS, necessary for a good stereo signal, has to be about:

$$38 \text{ kHz} + 15 \text{ kHz} = 53 \text{ kHz.}$$

(stereo subcarrier) (Upper side band channel)

For stereo signal reception, the arriving signals are applied to the gate circuit of the ANSS, in order to prevent the pilot signal from undergoing amplitude modulation (which causes noisy sound through the succeeding circuits), this pilot signal is first supplied to the 19 kHz trap filter, located prior to the gate circuit, where it is removed and only the audio signal can appear at the ANSS circuit then to be applied to the stereo multiplex circuit.

In addition, before being supplied to the 19kHz trap filter, a part of the stereo pilot signal is also applied to the VCO circuit, a part of the stereo multiplex circuit. Since the VCO circuit is of PLL system, if the pilot signal enter the VCO circuit, the PLL becomes completely locked so as to eliminate any possibility of noise occurrence in the stereo multiplex circuit due to the noise entered together with the pilot signal. In this way pulse noise caught by the antenna is eliminated.

Another feature of this system is that in FM stereo reception, the signal to noise ratio is improved, because

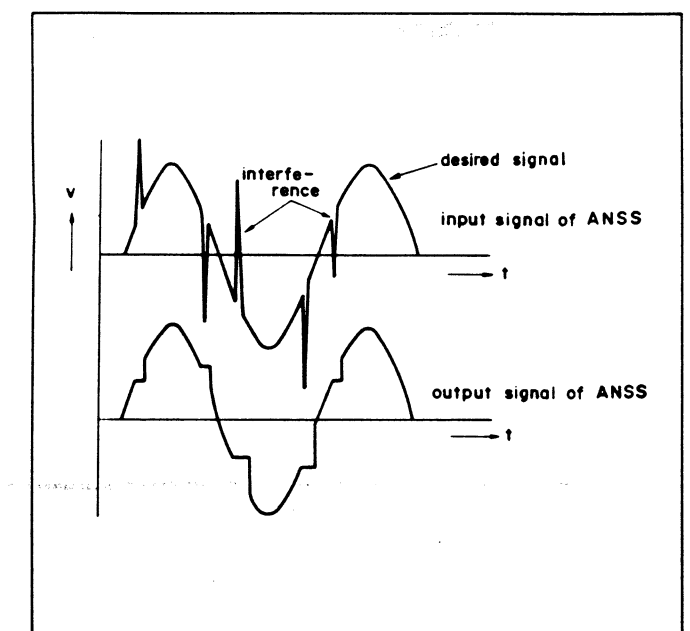


Figure 8

the stereo pilot signal has no possibility of mixing in the audio signal produced, being removed by the 19 kHz trap filter.

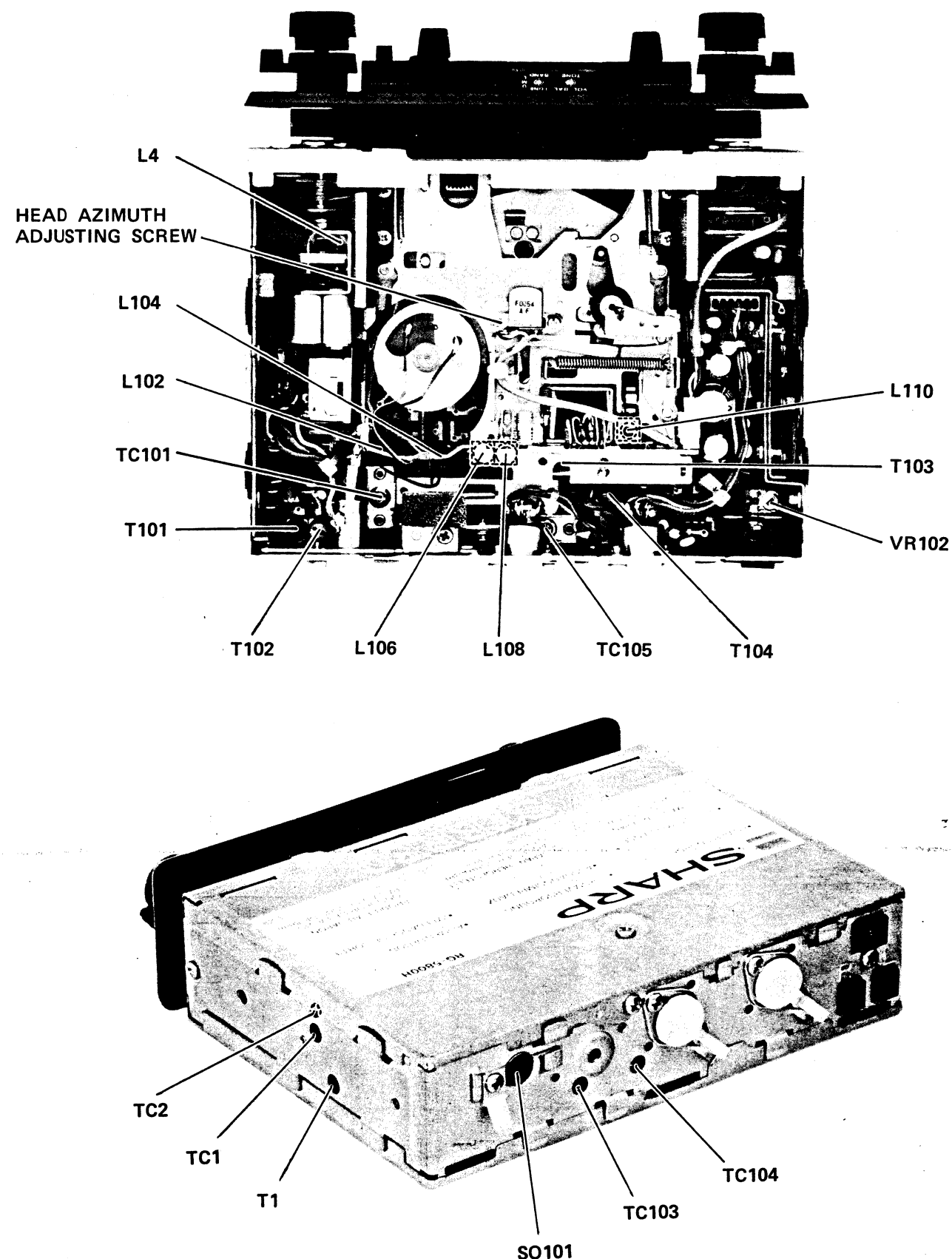


Figure 7 ALIGNMENT POINTS

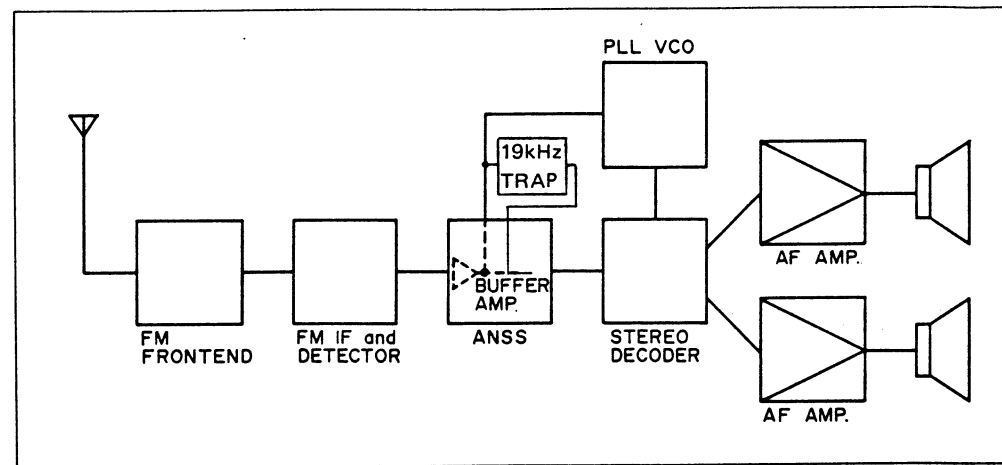


Figure 9

BLOCK DIAGRAM

The block diagram is shown in Fig. 10.

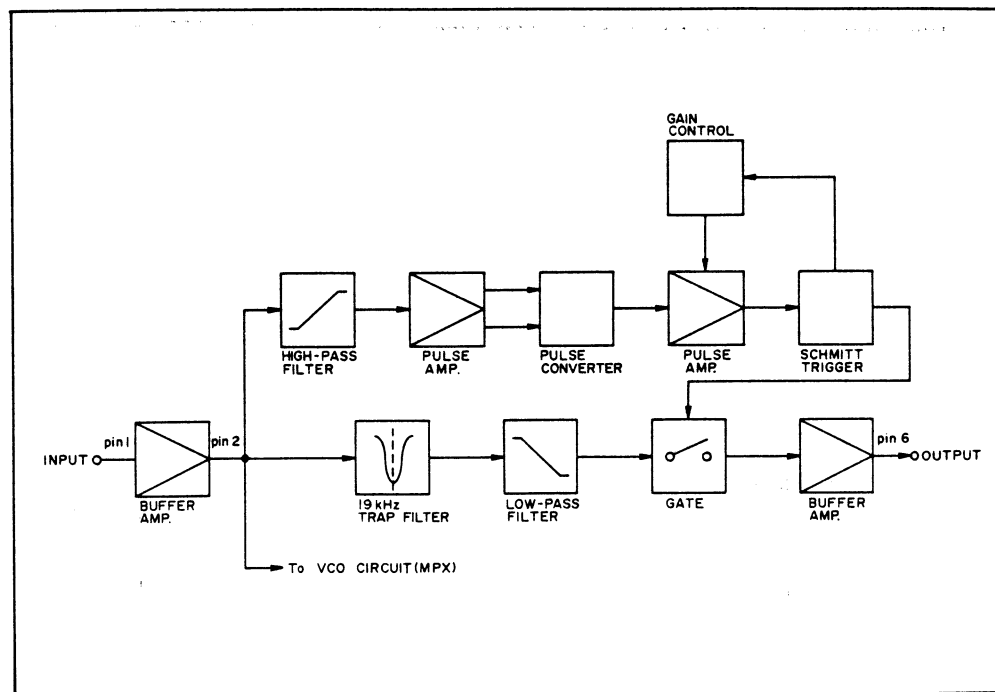


Figure 10

Explanation of the block diagram

Input signals at the pin 1, both the desired signal and pulse noise are appeared at the pin 2 via the buffer amplifier. Then, they are divided into the two, one to be applied to the high-pass filter side and another to the low-pass filter side.

In the high-pass filter, only pulse noise is picked out from the incoming signal, and this noise is amplified by the pulse amplifier. The noise thus amplified is transferred to the pulse converter where the negative pulse is converted to positive one to be supplied to the pulse amplifier where it is formed a strong signal enough to activate the Schmitt trigger.

Coming out of the Schmitt trigger, the signal is coupled to the gate circuit of the ANSS, which will be turned off. Also, the ANSS is equipped with the gain control circuit that will control the input signal of the Schmitt trigger, if a great amount of the continual pulse noises arrived, and prevent the gate circuit from turning off.

Meanwhile, in the low-pass filter side, the arriving signal is first applied to the 19 kHz trap filter where the stereo pilot signal is removed, and the remaining signal is coupled to the low-pass filter. The signal coming out of the low-pass filter, which has frequencies lower than 53 kHz, is then applied to the gate circuit. In this gate circuit, pulse noise,

if being included in the input signal, will be got rid of and so only the desired signal will be developed. However, being turned off, the gate circuit has no output. To prevent this, the ANSS is equipped with such a circuit that maintains output at the level just before the gate circuit is turned off. For this reason, there will be no

secondary noise appearance caused by switching of the gate circuit.

It is noted that a part of the stereo pilot signal is, without entering the 19 kHz trap filter, coupled to the VCO circuit (of the stereo multiplex circuit) to drive.

DESCRIPTION OF THE CIRCUIT

Input stage

The input stage consists of a simple emitter follower, see Fig. 11.

This stage has been added to the circuit in order to avoid an influence of the input impedance of the L.P. and H.P. filters on the output of the FM detector and reversed. To be sure that the circuit works correctly, the DC voltage at pin 1 needs to be $0.4 \times V_9 - V_{16}$ ($0.4 \times$ supply voltage). The input impedance at 1 kHz: $|Z_i| \geq 70$ K ohms.

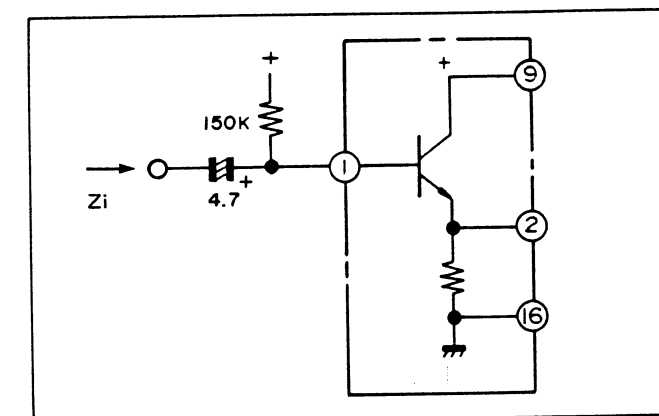


Figure 11

The low-pass filter (delay line)

To be sure of a good signal handling of the desired signal this filter has to meet next requirements.

- the delay time has to be at least $3 \mu\text{sec}$.
- the amplitude characteristic has to be as flat as possible in the pass-band.
- the phase behaviour has to be linear.
- the distortion of the desired information at the output must be as low as possible.

In order to meet these requirements use is made of a 4th order Butterworth filter realised by an active RC circuit. (see Fig. 12).

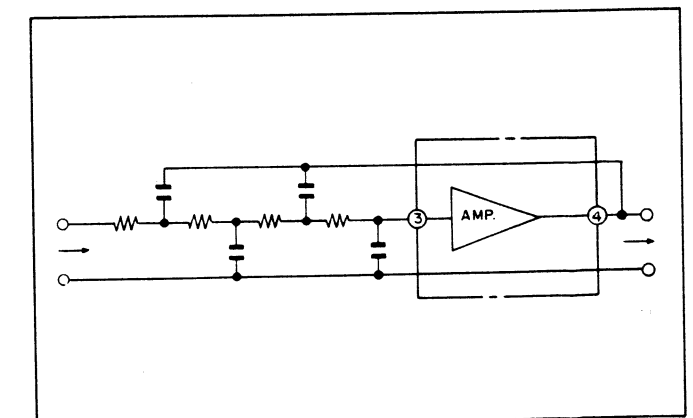


Figure 12

Gate circuit and output amplifier

The circuit is give in Fig. 13.

The point, indicated with P, is connected to the positive output of the Schmitt-trigger.

If there is a positive pulse at P then Qc becomes conducting and takes away the driving current for Qb. At the same time the base voltage of Qe will be kept constant by the RC circuit connected to pin 5.

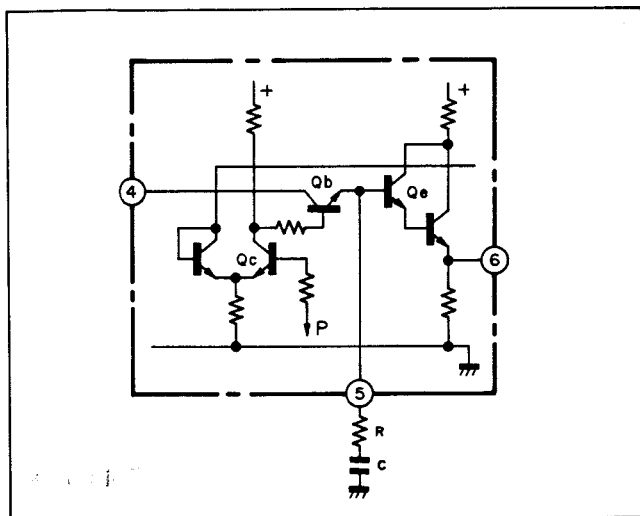


Figure 13

High pass filter

In order to detect the interferences out of the input signal a high pass filter is used.

In practice one wants to suppress as much interferences as possible in order to get a "clean" output signal.

The theoretical curve of the H.P. filter has been given in Fig. 15.

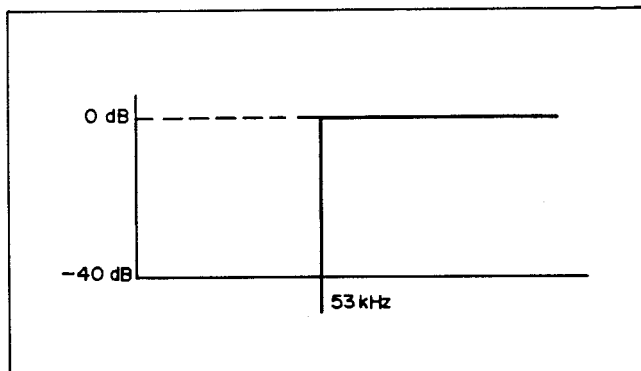


Figure 15

A practical approximation of this curve can be achieved by a 4th order Chebyshev filter at which for car radio applications -3dB can be chosen at 91kHz.

To get a steep slope an extra R and C are added circuit.

19 kHz filter

During suppression but without this filter the 19kHz signal will look like Fig. 14.

To be sure of no audible low-frequency component, the voltage during suppression needs to be zero. (See gap Fig. 14) However this happens only very sporadic so that filtering out of the undesired low frequency component is necessary, otherwise this low frequency component breaks through to the audio part via the MW-channel. Thus a 19kHz filter is added to the circuit.

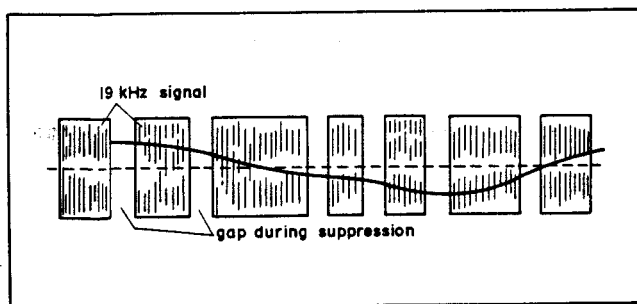


Figure 14

Gain control

The circuit is give in Fig. 16.

To be sure of an audible signal during a too high repetition rate of the interference pulses and/or a too intensive noise it is necessary to reduce the repetition rate of the suppression.

From the Schmitt-trigger the negative output pulses are fed to the integrating network connected to pin 12.

If V_C which is V_9-12 becomes $\geq V_{BEQ8}$ then the gain of the pulse amplifier will be reduced.

In case of noise, at which normally the "interference spikes" are very close to each other, it is better to build-up the voltage across C directly, because during one suppression time there are a lot of noise spikes.

This information for the gain control is lost if the negative output of Schmitt-trigger is used.

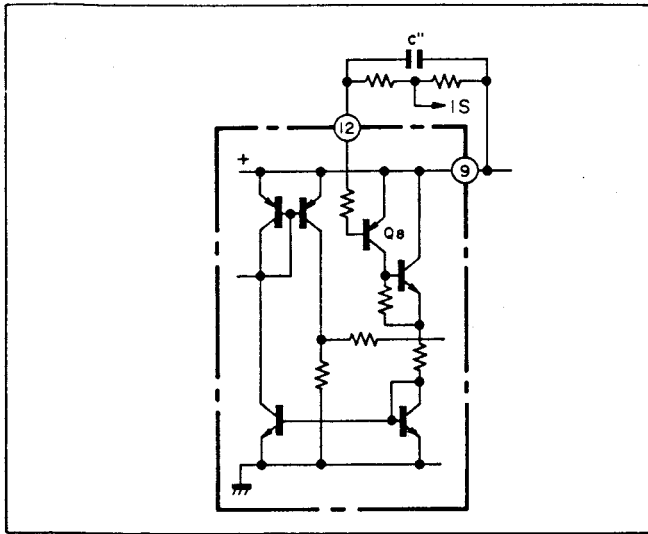


Figure 16

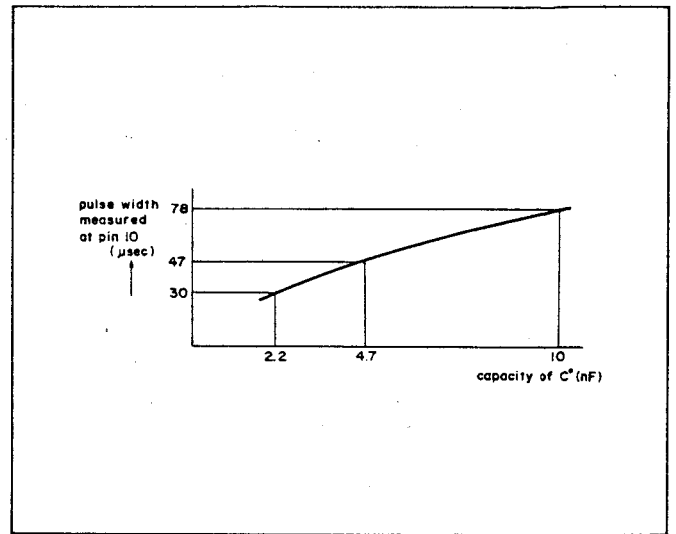


Figure 18

Schmitt-trigger

The circuit is shown in Fig. 17.

The positive output is used for driving the gate circuit while the negative output is fed to the gain control.

The pulse width of the pulses delivered by the Schmitt-trigger can be controlled by an RC network at pin 11 of Fig. 17.

The pulse width as function of the value of the C'' connected at pin 11 while the R'' is kept constant at 6.8K, is given in Fig. 18.

For measurements the pulse at the input of the ANSS (pin 1) has a pulse width of 10 μ sec., a rise time of 6 nsec. and a pulse height of 0.1V.

To ensure proper operation of the Schmitt trigger for various $R''C''$ combinations it is advised to measure the pulse at pin 1 and pin 10.

The depicted signals should have a shape as shown in Fig. 19.

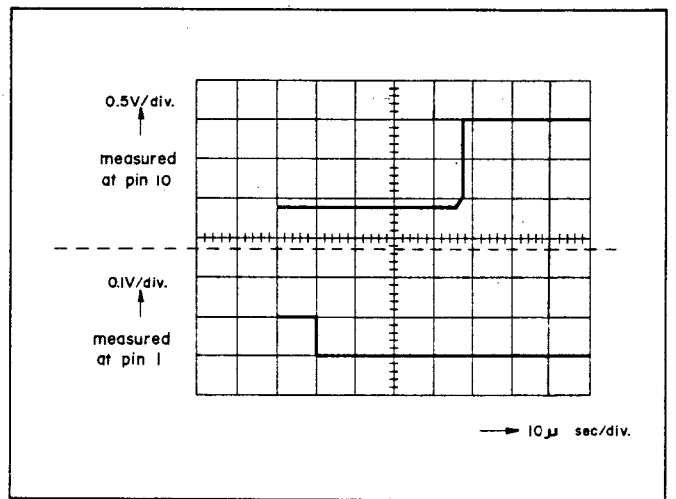


Figure 19

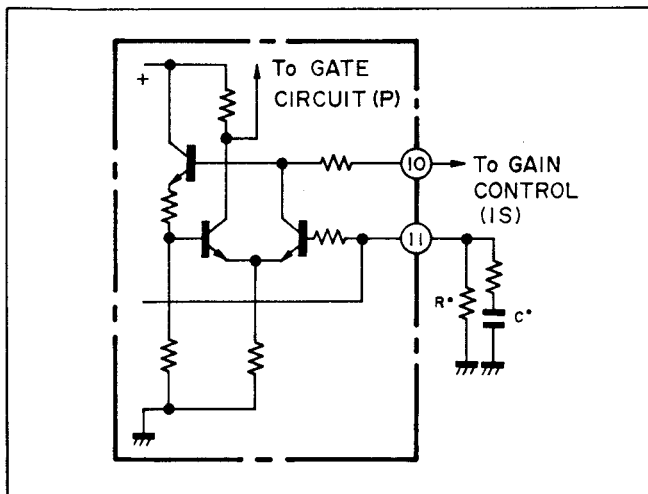


Figure 17

MECHANICAL ADJUSTMENT

FLYWHEEL THRUST CLEARANCE ADJUSTMENT (Refer to Figure 20)

Slowly tighten the screw for adjusting the flywheel thrust clearance until the thrust clearance becomes 0 (zero) and loosen the screw by $1/2 \sim 1$ turn from this point. Since screw's pitch is 0.5mm, thrust clearance of 0.1 ~ 0.3mm is produced.

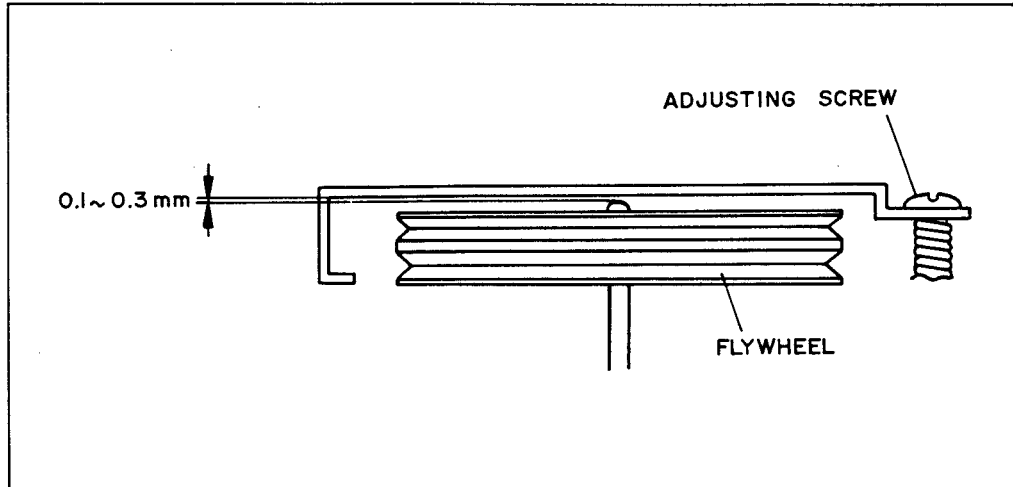


Figure 20

TIMING ADJUSTMENT OF RADIO/TAPE SELECTOR SWITCH (Refer to Figure 21)

At the moment the radio/tape selector switch turns to the tape position (and the motor starts to rotate), the gap between the pinch roller and the capstan shaft should be 0 ~ 0.2 mm. If the value is not satisfied, adjust the pushing arm by changing the setting position and/or bending.

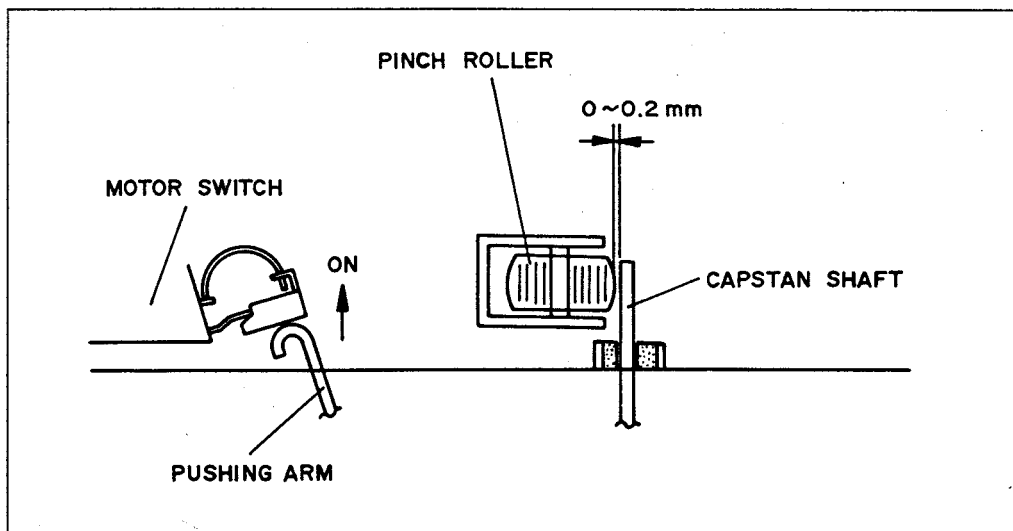


Figure 21

PINCH ROLLER PRESSURE ADJUSTMENT (Refer to Figure 22)

1. With power supply turned on, push the point ① with a tension gauge to make the pinch roller apart from the capstan shaft. Then, gradually release the tension gauge and read its value when the pressure roller starts to rotate.
2. It is normal that the tension gauge reads 320 ~ 380g. If the above value is not satisfied, change the setting position of Pinch Roller Spring.

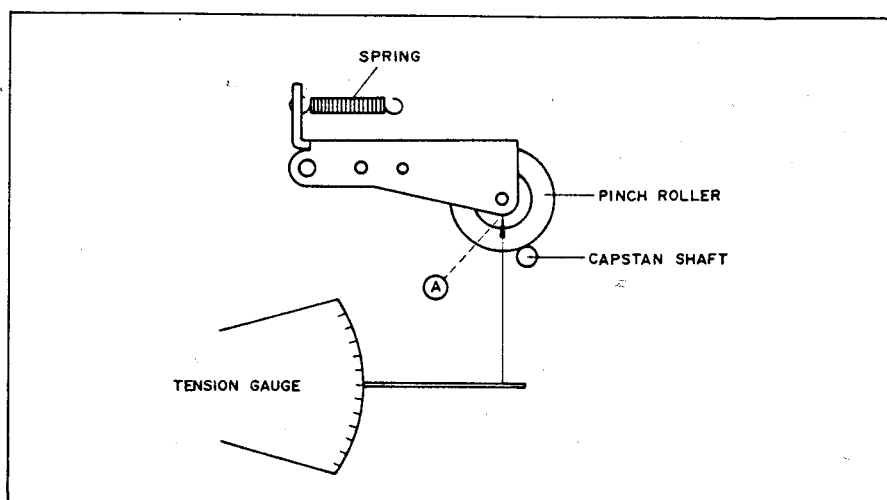


Figure 22

TORQUE CHECK (Refer to Figure 23)

1. Set the torque measuring reel to the turntable (the take-up side at play or fast forward mode and the supply side at rewind mode).
2. Then, rotate the reel in the same direction as for turntable and read the torque value when the pointer is stabilized.

Mode	Torque Value
Play	35 – 55 gr.cm
Fast Forward	More than 70 gr.cm
Rewind	More than 70 gr.cm

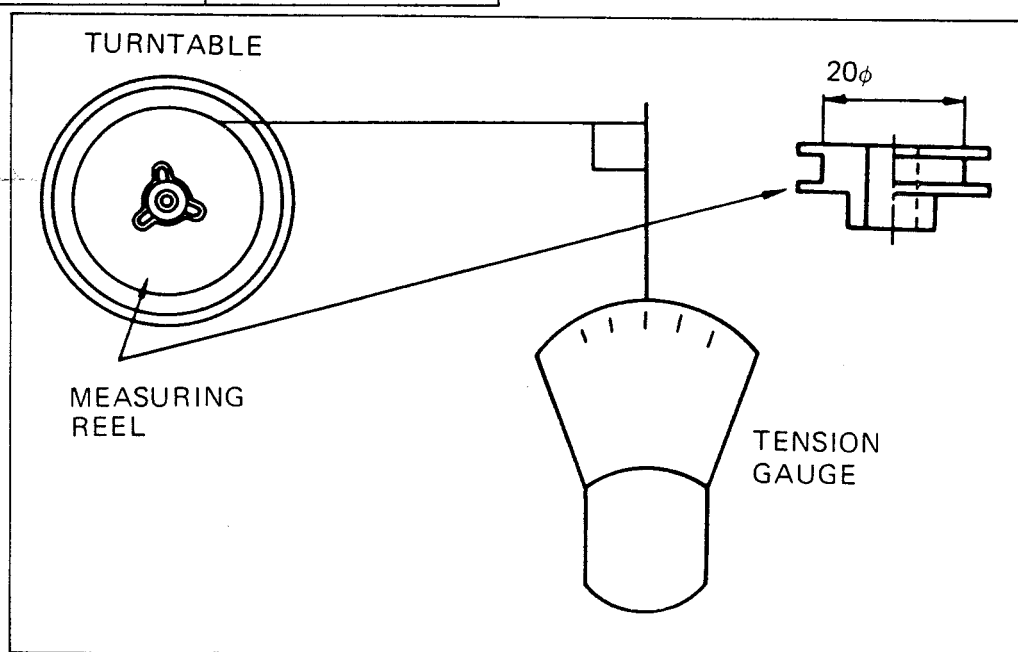


Figure 23

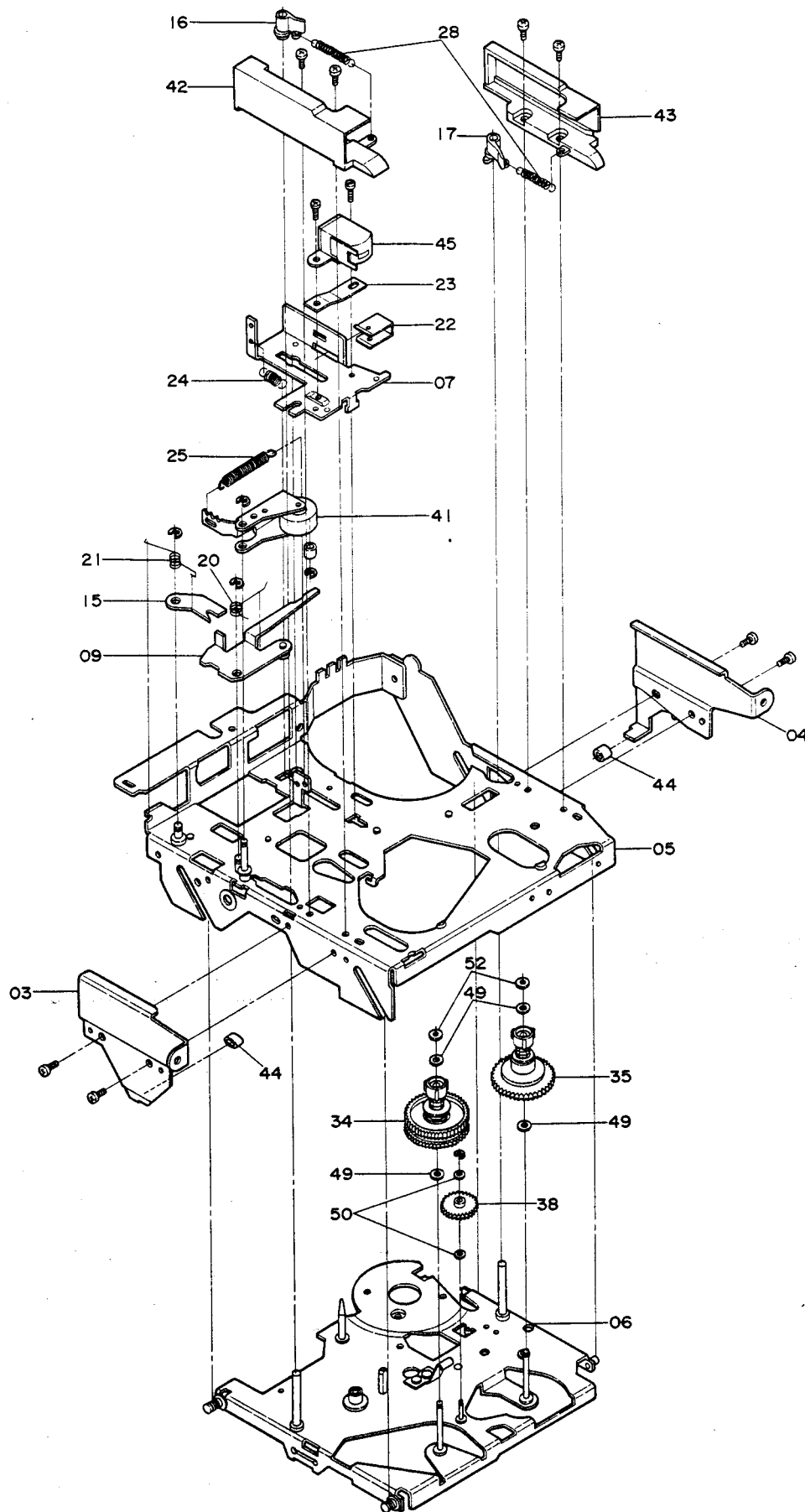


Figure 24 MECHANISM EXPLODED VIEW (UPPER SIDE)

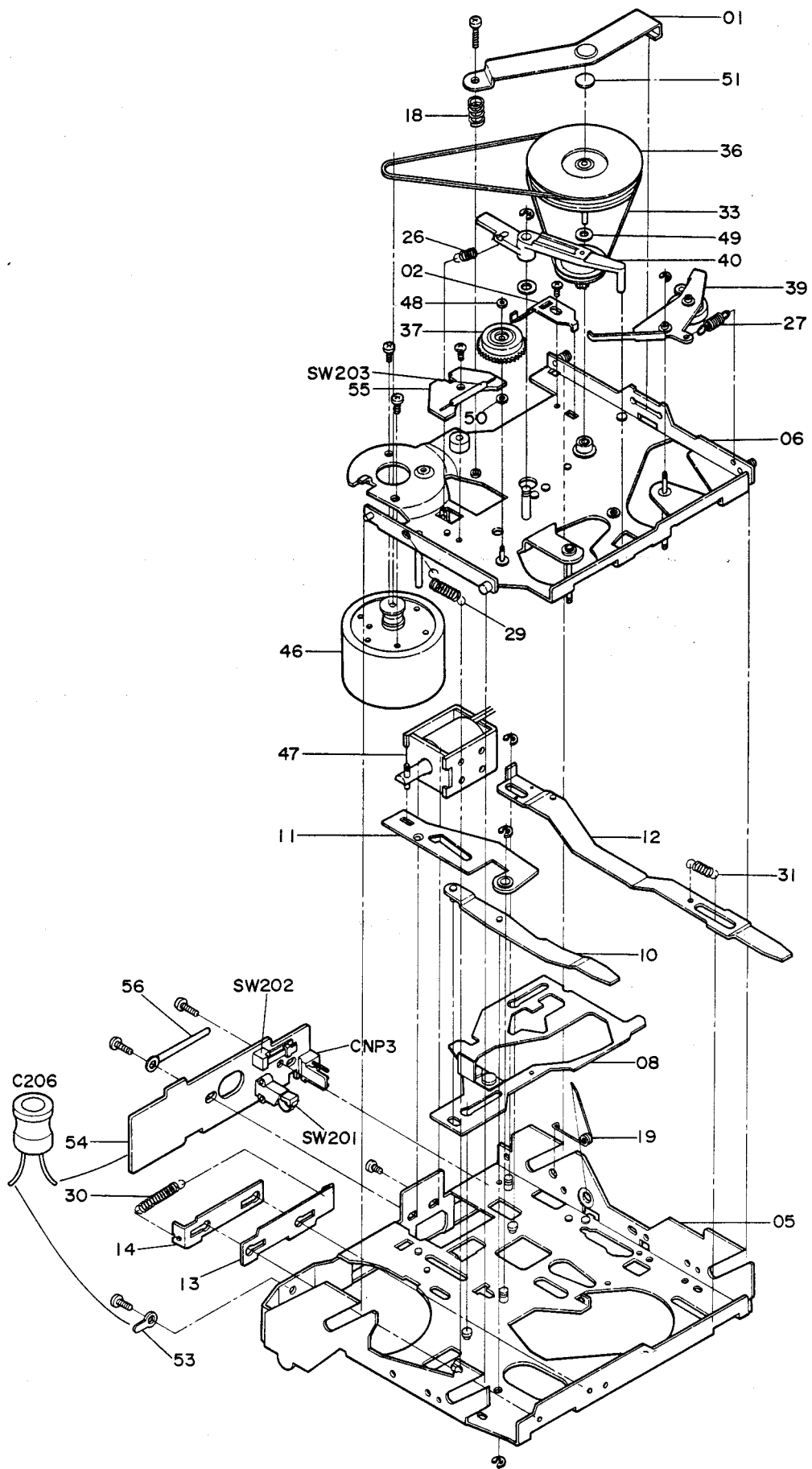


Figure 25 MECHANISM EXPLODED VIEW (LOWER SIDE)

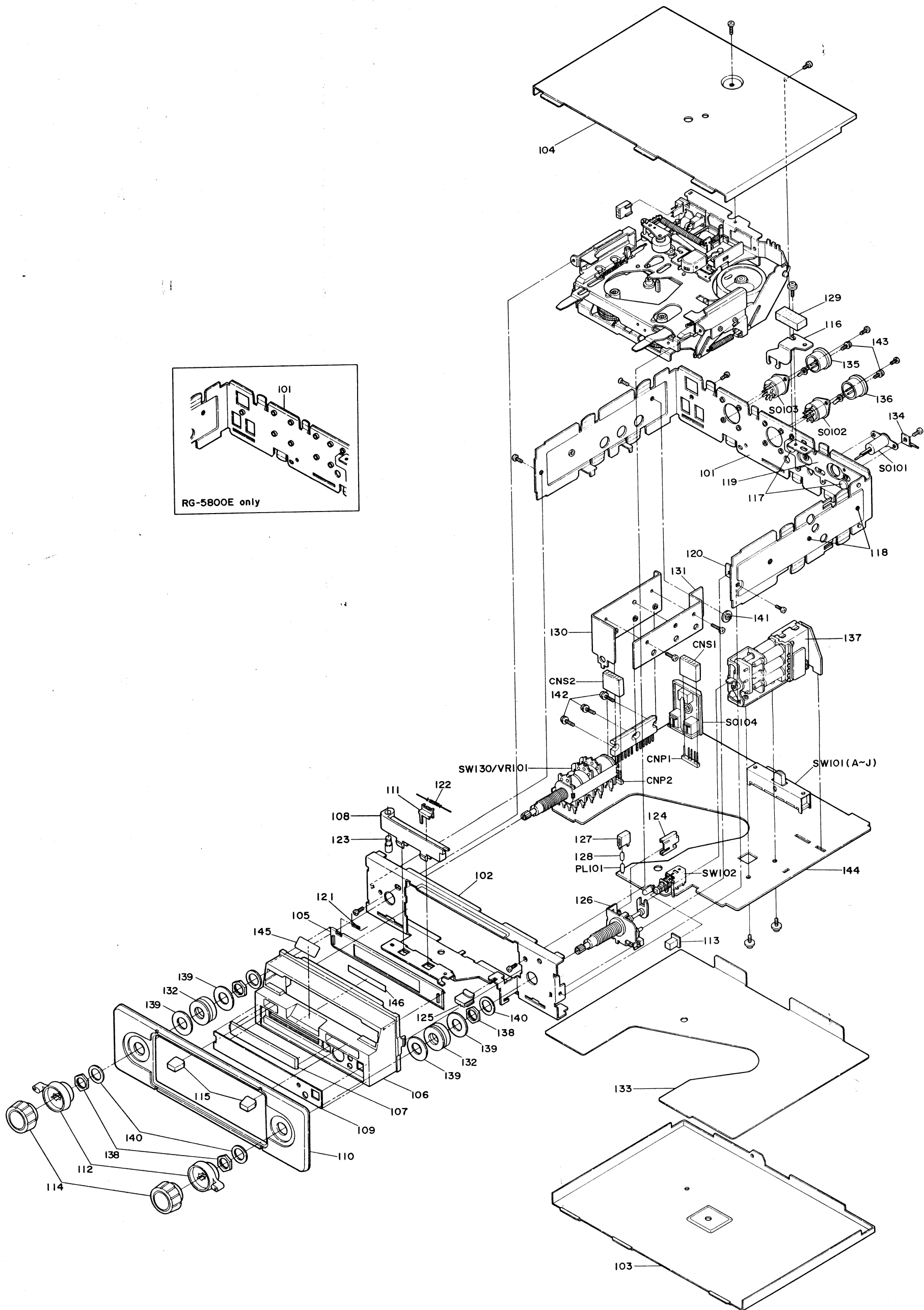


Figure 26 CABINET EXPLODED VIEW

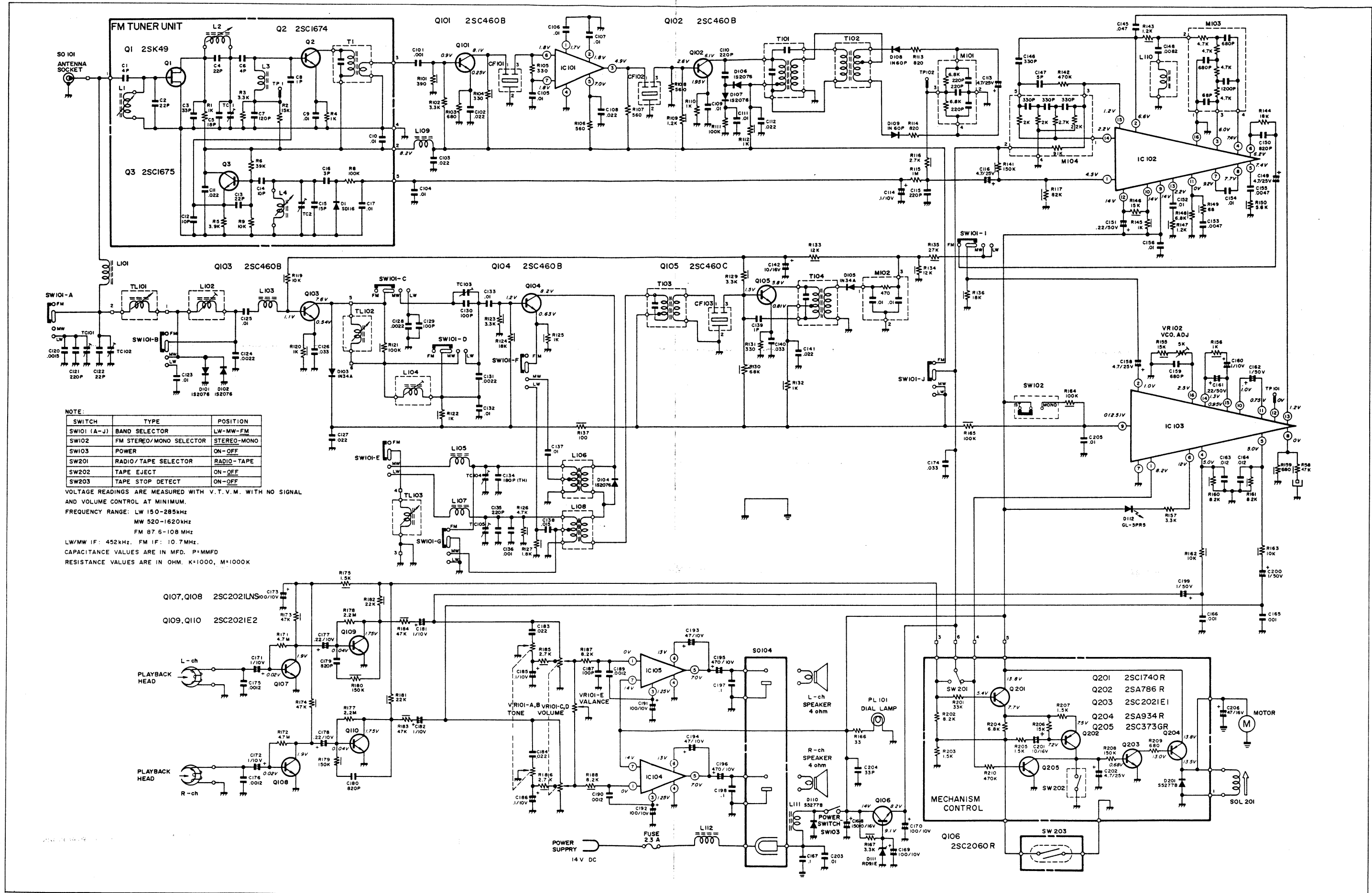


Figure 29 SCHEMATIC DIAGRAM (RG-5800E)

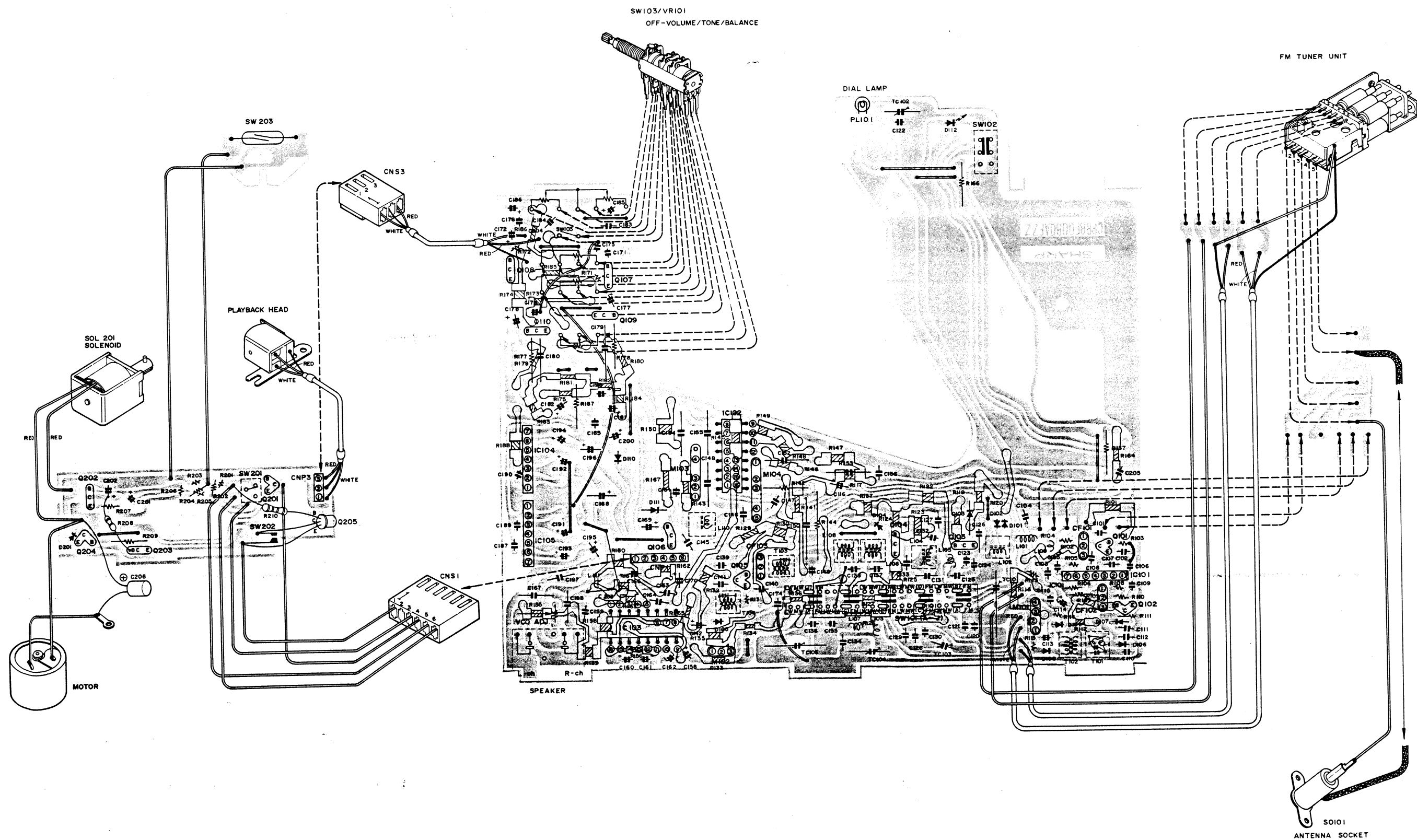


Figure 30 WIRING CONNECTIONS (RG-5800E)

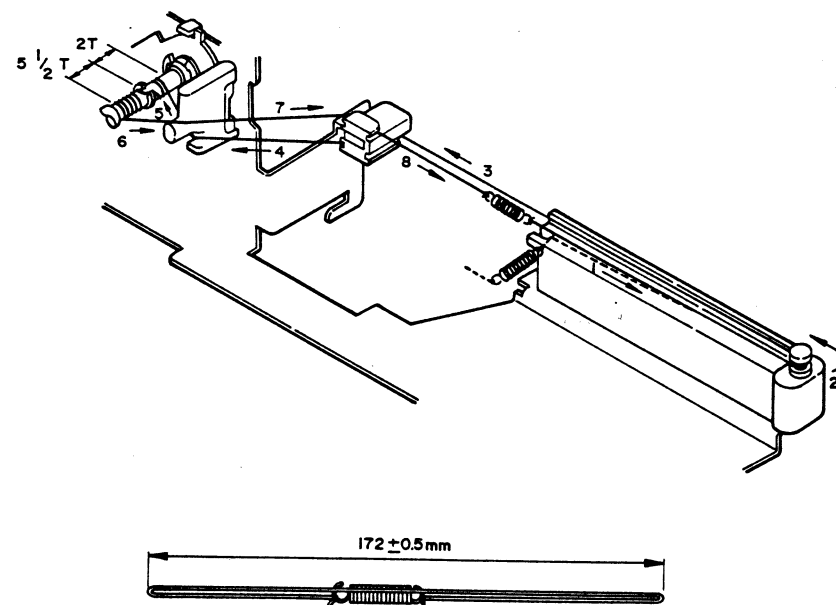


Figure 31 DIAL CORD STRINGING

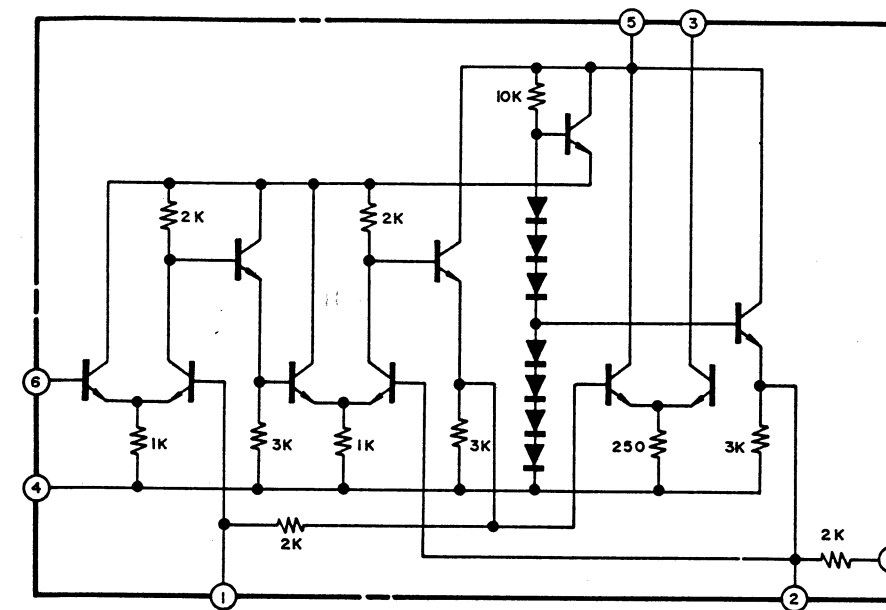


Figure 32 EQUIVALENT CIRCUIT OF IC101

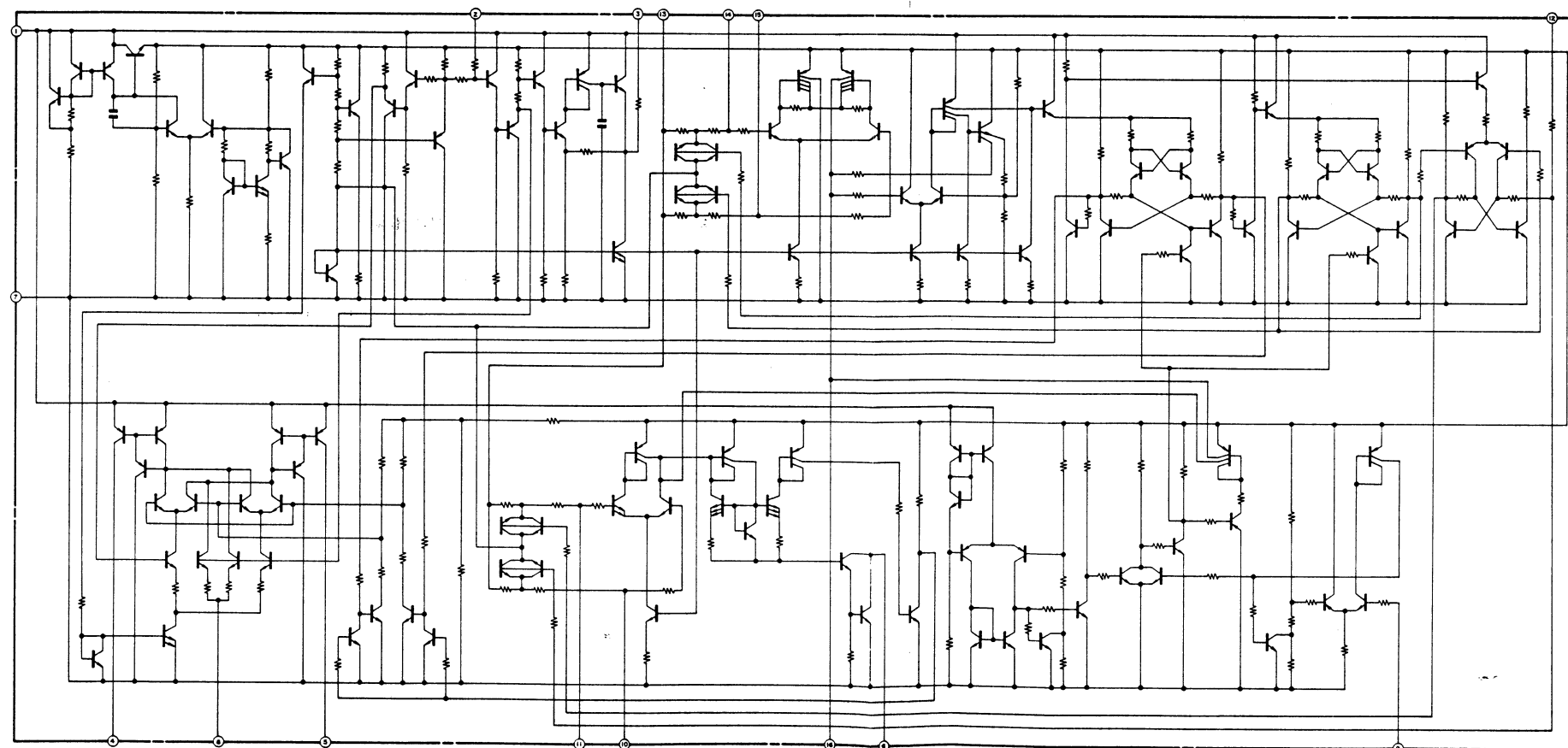
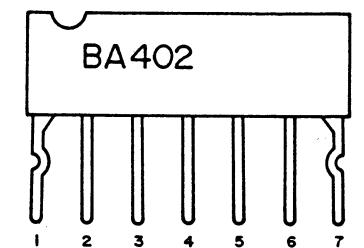
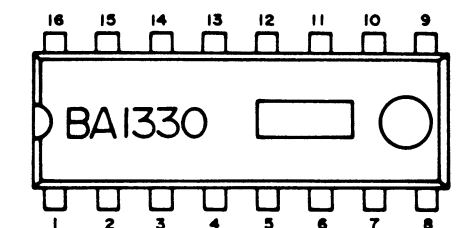


Figure 33 EQUIVALENT CIRCUIT OF IC103



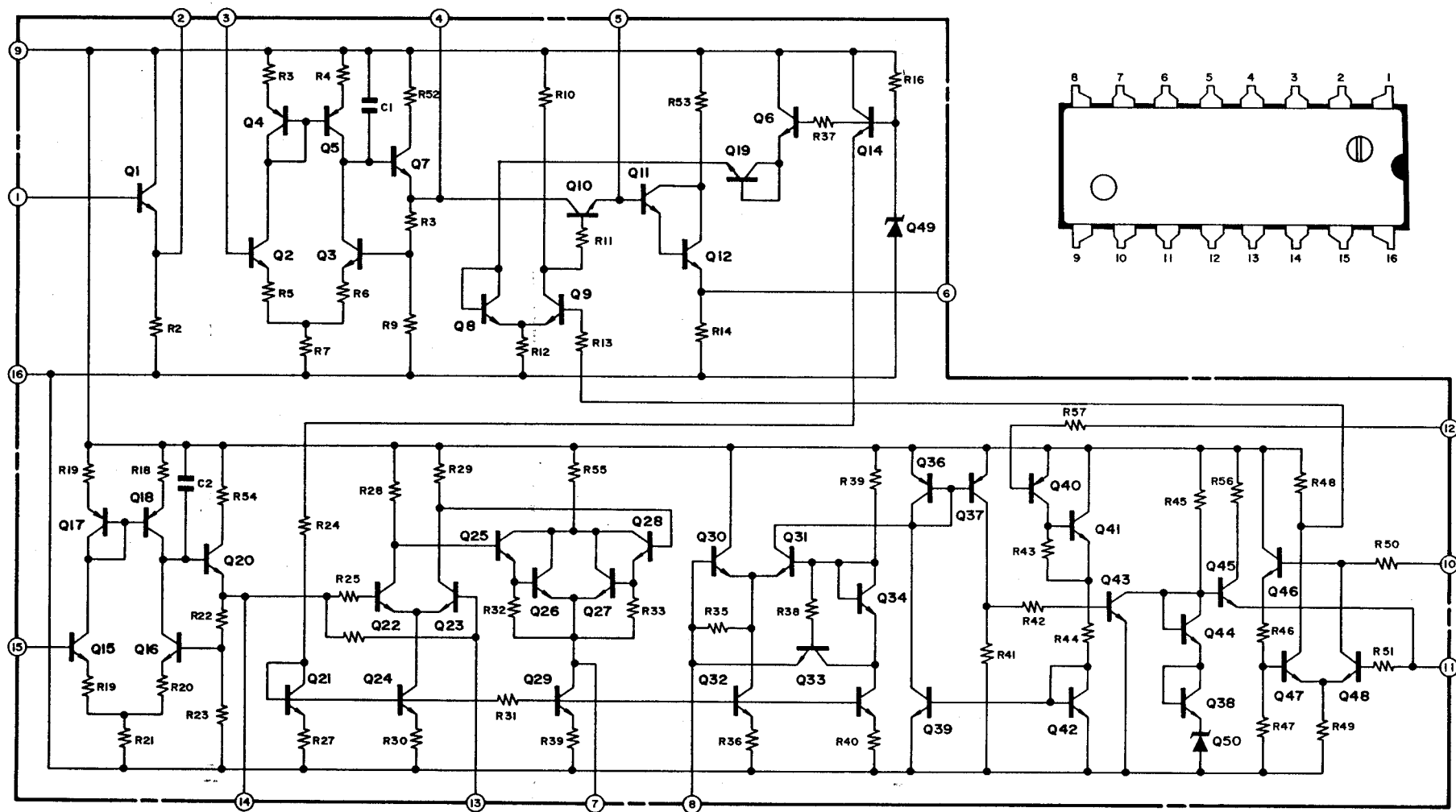


Figure 34 EQUIVALENT CIRCUIT OF IC102

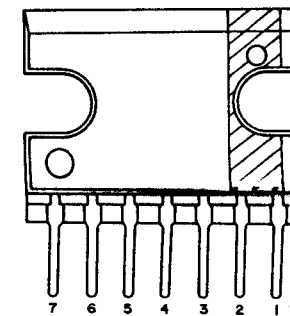
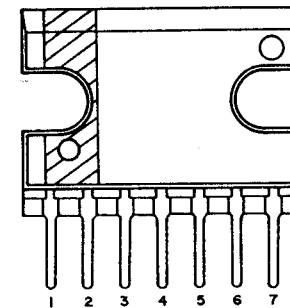
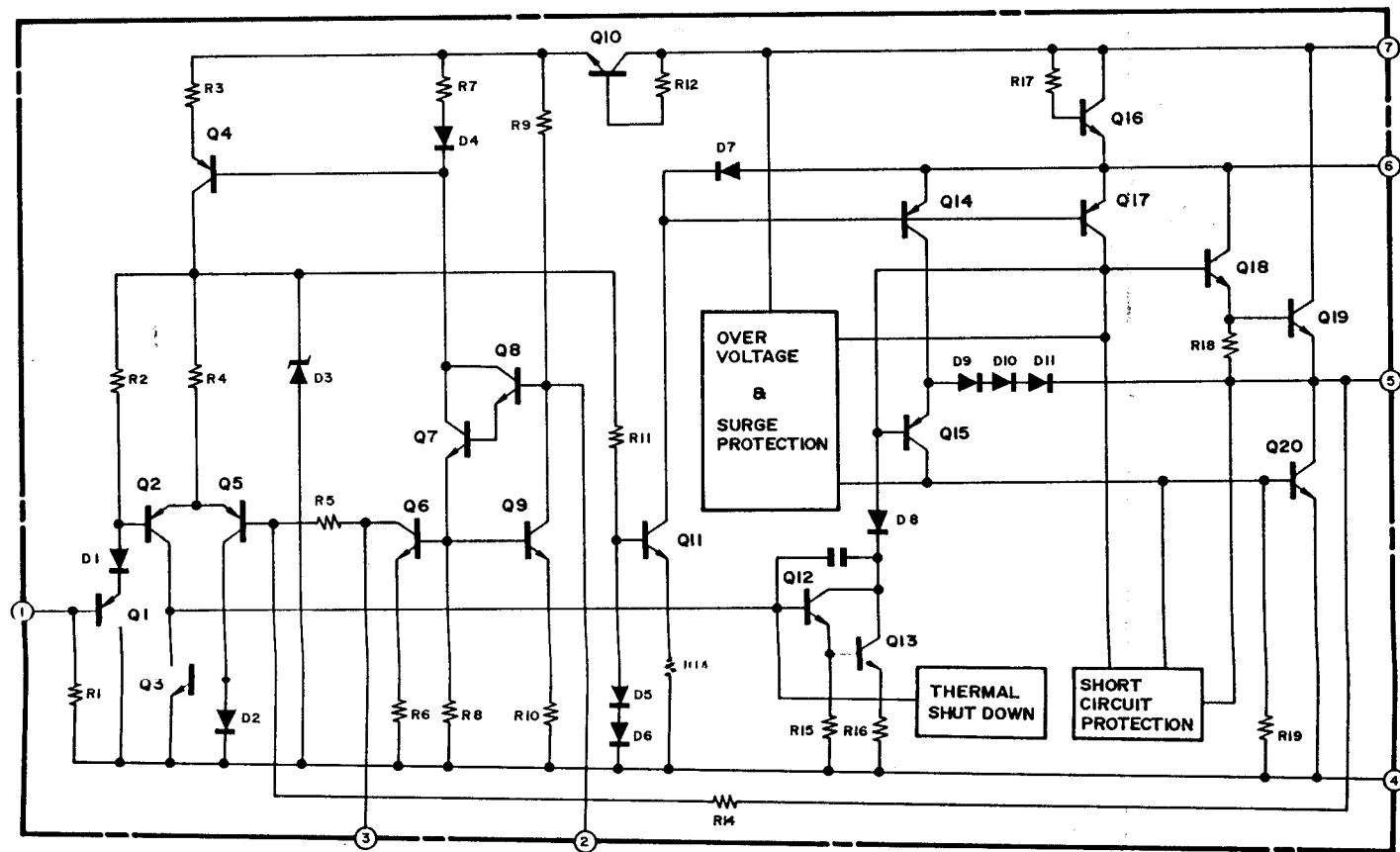


Figure 35 EQUIVALENT CIRCUIT OF IC104 and IC105

REPLACEMENT PARTS LIST

"HOW TO ORDER REPLACEMENT PARTS"

To have your order filled promptly and correctly, please furnish the following informations.

1. MODEL NUMBER
2. REF. NO.
3. PART NO.
4. DESCRIPTION

REF. NO.	PART NO.	DESCRIPTION	CODE	REF. NO.	PART NO.	DESCRIPTION	CODE
INTEGRATED CIRCUITS				L102	RCILA0301AFZZ	LW Antenna	AB
IC101	RH-IX0932AFZZ	FM IF Amp. (BA402)	AM	L103	RCILC0051AFZZ	Noise Filter	AC
IC102	RH-IX1110AFZZ	ANSS (HA11219)	AM	L104	RCILA0301AFZZ	LW RF	AB
IC103	RH-IX1109AFZZ	PLL FM Stereo Demodulator (BA1330)	AM	L105	RCILC0065AFZZ	MW Oscillation	AC
IC104	RH-IX1107AFZZ	Audio Power Amp. (μ PC1181H)	AN	L106	RCILB0322AFZZ	MW Oscillation	AD
IC105	RH-IX1108AFZZ	Audio Power Amp. (μ PC1182H)	AN	L107	RCILC0060AFZZ	LW Oscillation	AC
				L108	RCILB0307AFZZ	LW Oscillation	AD
				L109	RCILC0051AFZZ	Power Filter	AC
				L110	RCILZ0061AFZZ	19kHz Trap	AE
				L111	RCILF0067AFZZ	Power Filter	AD
TRANSISTORS				TRANSFORMERS			
Q101	VS2SC460-B/-1	FM IF Amp. (2SC460B)	AC	T101	RCILIO185AFZZ	FM Discriminator	AE
Q102	VS2SC460-B/-1	FM IF Amp. (2SC460B)	AC	T102	RCILIO182AFZZ	FM Discriminator	AE
Q103	VS2SC460-B/-1	AM RF Amp. (2SC460B)	AC	T103	RCILIO238AFZZ	AM IF	AD
Q104	VS2SC460-B/-1	AM Converter (2SC460B)	AC	T104	RCILIO170AFZZ	AM IF	AD
Q105	VS2SC460-C/-1	AM IF Amp. (2SC460C)	AC				
Q106	VS2SC2060R/-1	Voltage Regulator (2SC2060R)	AD	FILTERS			
Q107	VS2SC2021 LNS1	Tape Pre Amp. (2SC2021 LNS)	AC	CF101	RFILF0009AFZZ	Ceramic, 10.7MHz, FM IF	AE
Q108	VS2SC2021 LNS1	Tape Pre Amp. (2SC2021 LNS)	AC	CF102	RFILF0009AFZZ	Ceramic, 10.7MHz, FM IF	AE
Q109	VS2SC2021 E21F	Tape Pre Amp. (2SC2021 E2)	AB	CF103	RFILA0059AFZZ	Ceramic, 452kHz, AM IF	AD
Q110	VS2SC2021 E21F	Tape Pre Amp. (2SC2021 E2)	AB				
Q201	VS2SC1740R/-1	Solenoid Control (2SC1740R)	AC	PACKAGED CIRCUIT			
Q202	VS2SA786-R/-1	Solenoid Control (2SC786R)	AC	M101	RMPTA0105AFZZ	6.8K ohm x 2 + 220PF x 3	AC
Q203	VS2SC2021 E11F	Solenoid Control (2SC2021 E1)	AB	M102	RMPTA0108AFZZ	470 ohm + .01MFD x 2	AC
Q204	VS2SA934-R/-1	Solenoid Drive (2SA934R)	AD	M103	RMPTA0107AFZZ	4.7K ohm x 4 + 68PF + 680PF x 2 + 1200PF	AG
Q205	VS2SC373-G/-1	Solenoid Control (2SC373GR)	AC	M104	RMPTA0106AFZZ	2K ohm x 2 + 2.7K ohm + 22K ohm + 91K ohm + 330PF x 3	AF
DIODES				CONTROLS			
D101	VHD1S2076//1	Protector (1S2076)	AG	VR101	RVR-B0164AFZZ	Volume/Tone/Balance Control and Power Switch	AU
D102	VHD1S2076//1	Protector (1S2076)	AG	(A~E),			
D103	VHD1N34A///1	AM Overload (1N34A)	AC	SW103			
D104	VHD1S2076//1	Stabilizer (1S2076)	AG	VR102	RVR-M0003SGZZ	5K ohm (B), VCO Frequency Adjustment	AC
D105	VHD1N34A///1	AM Detector (1N34A)	AC	TC101	RTO-A1004AFZZ	Trimmer, LW Antenna	AH
D106	VHD1S2076//1	Noise Limiter (1S2076)	AG	TC102	RTO-A1053AFZZ	Trimmer, MW Antenna	AD
D107	VHD1S2076//1	Noise Limiter (1S2076)	AG	TC103	RTO-A1052AFZZ	Trimmer, MW RF	AD
D108	VHD1N60////3	FM Detector (1N60P)	AH	TC104	RTO-A1052AFZZ	Trimmer, MW Oscillation	AD
D109	VHD1N60////3	FM Detector (1N60P)	AH	TC105	RTO-A1004AFZZ	Trimmer, LW Oscillation	AH
D110	VHDS5277B//1	Protector (S5277B)	AB				
D111	VHERD9.1ED/-1	Zener (Voltage Regulator) (RD9.1E)	AC	CAPACITORS			
D112	VHPGL-5PR5/1F	FM Stereo Indicator (GL-5PR5)	AD	C101	VCQYKU1HM102M	.001MFD, 50V, \pm 20%, Mylar	AB
D201	VHDS5277B//1	Protector (S5277B)	AB	C102	VCTYPU1EX223K	.022MFD, 25V, \pm 10%, Ceramic	AB
COILS				C103	VCTYPU1EX223M	.022MFD, 25V, \pm 20%, Ceramic	AA
L101	RCILC0065AFZZ	Choke	AC	C104	VCTYPU1EX103M	.01MFD, 25V, \pm 20%, Ceramic	AA

PARTS LIST

REF. NO.	PART NO.	DESCRIPTION	CODE	REF. NO.	PART NO.	DESCRIPTION	CODE
C105	VCTYPU1EX103M	.01MFD, 25V, $\pm 20\%$, Ceramic	AA	C159	VCQSMU1HS681J	680PF, 50V, $\pm 5\%$, Styrol	AB
C106	VCTYPU1EX103M	.01MFD, 25V, $\pm 20\%$, Ceramic	AA	C160	VCAAKU1AA105M	1MFD, 10V, $\pm 20\%$, Electrolytic	AD
C107	VCTYPU1EX103M	.01MFD, 25V, $\pm 20\%$, Ceramic	AA	C161	VCAA AU1AB224M	.22MFD, 10V, $\pm 20\%$, Electrolytic	AC
C108	VCTYPU1EX223K	.022MFD, 25V, $\pm 10\%$, Ceramic	AB	C162	VCEAAU1HW105A	1MFD, 50V, $\pm 75 - 10\%$, Electrolytic	AB
C109	VCQYKU1HM103M	.01MFD, 50V, $\pm 20\%$, Mylar	AB	C163	VCTYPU1EX123K	.012MFD, 25V, $\pm 10\%$, Ceramic	AB
C110	VCRYPU1HB221J	220PF, 50V, $\pm 5\%$, Ceramic	AB	C164	VCTYPU1EX123K	.012MFD, 25V, $\pm 10\%$, Ceramic	AB
C111	VCTYPU1EX103M	.01MFD, 25V, $\pm 20\%$, Ceramic	AA	C165	VCTYPU1EX102K	.001MFD, 25V, $\pm 10\%$, Ceramic	AA
C112	VCTYPU1EX223K	.022MFD, 25V, $\pm 10\%$, Ceramic	AB	C166	VCTYPU1EX102K	.001MFD, 25V, $\pm 10\%$, Ceramic	AA
C113	VCEAAU1EW475A	4.7MFD, 25V, $\pm 75 - 10\%$, Electrolytic	AB	C167	VCKZPU1HF104Z	.1MFD, 50V, $\pm 80 - 20\%$, Ceramic	AC
C114	VCAA AU1AB104M	.1MFD, 10V, $\pm 20\%$, Electrolytic	AC	C168	RC-EZ1075AFZZ	1500MFD, 16V, $\pm 50 - 10\%$, Electrolytic	AE
C115	VCRYPU1HB221J	220PF, 50V, $\pm 5\%$, Ceramic	AB	C169	RC-EZS107AF1A	100MFD, 10V, $\pm 50 - 10\%$, Electrolytic	AB
C116	VCEAAU1EW475A	4.5MFD, 25V, $\pm 75 - 10\%$, Electrolytic	AB	C170	RC-EZS107AF1A	100MFD, 10V, $\pm 50 - 10\%$, Electrolytic	AB
C120	VCQYKU1HM152J	.0015MFD, 50V, $\pm 5\%$, Mylar	AC	C171	VCAAKU1AA105M	1MFD, 10V, $\pm 20\%$, Electrolytic	AD
C121	VCRYPU1HB221J	220PF, 50V, $\pm 5\%$, Ceramic	AB	C172	VCAA AU1AB105M	1MFD, 10V, $\pm 20\%$, Electrolytic	AD
C122	VCCSPU1HL220J	22PF, 50V, $\pm 5\%$, Ceramic	AA	C173	RC-EZS107AF1A	100MFD, 10V, $\pm 50 - 10\%$, Electrolytic	AB
C123	VCTYPU1EX103M	.01MFD, 25V, $\pm 20\%$, Ceramic	AA	C174	VCTYPU1EX333M	.033MFD, 25V, $\pm 20\%$, Ceramic	AB
C124	VCQYKU1HM222M	.0022MFD, 50V, $\pm 20\%$, Mylar	AB	C175	VCTYPU1EX122K	.0012MFD, 25V, $\pm 10\%$, Ceramic	AA
C125	VCQYKU1HM103M	.01MFD, 50V, $\pm 20\%$, Mylar	AB	C176	VCTYPU1EX122K	.0012MFD, 25V, $\pm 10\%$, Ceramic	AA
C126	VCTYPU1EX333M	.033MFD, 25V, $\pm 20\%$, Ceramic	AB	C177	VCAAKU1AA224M	.22MFD, 10V, $\pm 20\%$, Electrolytic	AC
C127	VCTYPU1EX223M	.022MFD, 25V, $\pm 20\%$, Ceramic	AA	C178	VCAAKU1AA224M	.22MFD, 10V, $\pm 20\%$, Electrolytic	AC
C128	VCQYKU1HM222J	.0022MFD, 50V, $\pm 5\%$, Mylar	AB	C179	VCKYAT1HB821K	820PF, 50V, $\pm 10\%$, Ceramic	AA
C129	VCRYPU1HB101J	100PF, 50V, $\pm 5\%$, Ceramic	AA	C180	VCKYAT1HB821K	820PF, 50V, $\pm 10\%$, Ceramic	AA
C130	VCRYPU1HB101J	100PF, 50V, $\pm 5\%$, Ceramic	AA	C181	VCAAKU1AA105M	1MFD, 10V, $\pm 20\%$, Electrolytic	AD
C131	VCTYPU1EX222M	.0022MFD, 25V, $\pm 20\%$, Ceramic	AA	C182	VCAAKU1AA105M	1MFD, 10V, $\pm 20\%$, Electrolytic	AD
C132	VCTYPU1EX103M	.01MFD, 25V, $\pm 20\%$, Ceramic	AA	C183	VCTYPU1EX223K	.022MFD, 25V, $\pm 10\%$, Ceramic	AB
C133	VCQYKU1HM103M	.01MFD, 50V, $\pm 20\%$, Mylar	AB	C184	VCTYPU1EX223K	.022MFD, 25V, $\pm 10\%$, Ceramic	AB
C134	VCCTPU1HH181J	180PF (TH), 50V, $\pm 5\%$, Ceramic	AB	C185	VCAA AU1AB104M	.1MFD, 10V, $\pm 20\%$, Electrolytic	AC
C135	VCRYPU1HB221J	220PF, 50V, $\pm 5\%$, Ceramic	AB	C186	VCAA AU1AB104M	.1MFD, 10V, $\pm 20\%$, Electrolytic	AC
C136	VCQYKU1HM102K	.001MFD, 50V, $\pm 10\%$, Mylar	AB	C187	VCRYPU1HB101J	100PF, 50V, $\pm 5\%$, Ceramic	AA
C137	VCQYKU1HM103M	.01MFD, 50V, $\pm 20\%$, Mylar	AB	C189	VCTYPU1EX122K	.0012MFD, 25V, $\pm 10\%$, Ceramic	AA
C138	VCQYKU1HM153M	.015MFD, 50V, $\pm 20\%$, Mylar	AB	C190	VCTYPU1EX122K	.0012MFD, 25V, $\pm 10\%$, Ceramic	AA
C139	VCCSPU1HL1R0C	1PF, 50V, ± 25 PF, Ceramic	AA	C191	RC-EZS107AF1A	100MFD, 10V, $\pm 50 - 10\%$, Electrolytic	AB
C140	VCQYKU1HM333M	.033MFD, 50V, $\pm 20\%$, Mylar	AB	C192	RC-EZS107AF1A	100MFD, 10V, $\pm 50 - 10\%$, Electrolytic	AB
C141	VCTYPU1EX223K	.022MFD, 25V, $\pm 10\%$, Ceramic	AB	C193	VCEAAU1AW476Y	47MFD, 10V, $\pm 50 - 10\%$, Electrolytic	AB
C142	VCEAAU1CW106Y	10MFD, 16V, $\pm 50 - 10\%$, Electrolytic	AB	C194	VCEAAU1AW476Y	47MFD, 10V, $\pm 50 - 10\%$, Electrolytic	AB
C145	VCTYPU1EX473M	.047MFD, 25V, $\pm 20\%$, Ceramic	AB	C195	RC-EZS477AF1A	470MFD, 10V, $\pm 50 - 10\%$, Electrolytic	AC
C146	VCRYPU1HB331J	330PF, 50V, $\pm 5\%$, Ceramic	AB	C196	RC-EZS477AF1A	470MFD, 10V, $\pm 50 - 10\%$, Electrolytic	AC
C147	VCCSPU1HL5R0C	5PF, 50V, ± 25 PF, Ceramic	AA	C197	VCQYKU1HM104M	.1MFD, 50V, $\pm 20\%$, Mylar	AC
C148	VCTYAT1EX822N	.0082MFD, 25V, $\pm 30\%$, Ceramic	AA	C198	VCQYKU1HM104M	.1MFD, 50V, $\pm 20\%$, Mylar	AC
C149	VCEAAU1EW475A	4.7MFD, 25V, $\pm 75 - 10\%$, Electrolytic	AB	C199	VCEAAU1HW105A	1MFD, 50V, $\pm 75 - 10\%$, Electrolytic	AB
C150	VCKYAT1HB821K	820PF, 50V, $\pm 10\%$, Ceramic	AA	C200	VCEAAU1HW105A	1MFD, 50V, $\pm 75 - 10\%$, Electrolytic	AB
C151	VCEALU1HC224M	.22MFD, 50V, $\pm 20\%$, Electrolytic	AB				
C152	VCTYAT1EX103N	.01MFD, 25V, $\pm 30\%$, Ceramic	AA				
C153	VCTYAT1EX472N	.0047MFD, 25V, $\pm 30\%$, Ceramic	AA				
C154	VCTYAT1EX103N	.01MFD, 25V, $\pm 30\%$, Ceramic	AA				
C155	VCTYAT1EX472N	.0047MFD, 25V, $\pm 30\%$, Ceramic	AA				
C156	VCTYPU1EX103M	.01MFD, 25V, $\pm 20\%$, Ceramic	AA				
C158	VCEAAU1EW475A	4.7MFD, 25V, $\pm 75 - 10\%$, Electrolytic	AB				

PARTS LIST

REF. NO.	PART NO.	DESCRIPTION	CODE	REF. NO.	PART NO.	DESCRIPTION	CODE
C201	VCEAAU1CW106Y	10MFD, 16V, +50 -10%, Electrolytic	AB	06	LCHSM0298AFZZ	Chassis, Sliding	
C202	VCEAAU1EW475A	4.7MFD, 25V, +75 -10%, Electrolytic	AB	07	LCHSS0133AFZZ	Head Base	
C203	VCTYPU1EX103M	.01MFD, 25V, ±20%, Ceramic	AA	08	MLEVF0818AFZZ	Lever, Fast Forward/Rewind	AB
C204	VCCSPU1HL330J	33PF, 50V, ±5%, Ceramic	AA	09	MLEVF0819AFZZ	Lever, Fast Forward/Rewind Lock	AA
C205	VCTYPU1EX103M	.01MFD, 25V, ±20%, Ceramic	AA	10	MLEVF0820AFZZ	Lever, Fast Forward/Rewind	AA
C206	RC-EZS476AF1C	47MFD, 16V, +50 -10%, Electrolytic	AB	11	MLEVF0821AFZZ	Lever, Play Lock	AA
				12	MLEVF0822AFZZ	Lever, Eject	AA
				13	MLEVF0823AFZZ	Lever, Fast Forward Return	AB
				14	MLEVF0824AFFW	Lever, Rewind Return	AB
				15	MLEVF0825AFZZ	Lever, Eject Prevent	AA
				16	MLEVP0116AFZZ	Lever, Cassette Ejector (L)	
				17	MLEVP0117AFZZ	Lever, Cassette Ejector (R)	
				18	MSPRC0168AFFJ	Spring, Flywheel Thrust Adjust	AA
				19	MSPRD0193AFFJ	Spring, Sliding Chassis Return (L)	AB
				20	MSPRD0194AFFJ	Spring, Fast Forward/Rewind Lock Lever	AA
				21	MSPRD0195AFFJ	Spring, Eject Prevent Lever	AA
				22	MSPRP0189AFFJ	Spring, Head Base Pressure	AB
				23	MSPRP0190AFFJ	Spring, Head Azimuth Adjust	AB
				24	MSPRT0538AFFJ	Spring, Head Base	AA
				25	MSPRT0539AFFJ	Spring, Pinch Roller	AB
				26	MSPRT0540AFFJ	Spring, Rewind Gear	AA
				27	MSPRT0541AFFJ	Spring, Fast Forward Roller	AA
				28	MSPRT0542AFFJ	Spring, Cassette Ejector Lever	AA
				29	MSPRT0543AFFJ	Spring, Sliding Chassis Return (R)	AB
				30	MSPRT0544AFFJ	Spring, Fast Forward/Rewind Lever	AA
				31	MSPRT0545AFFJ	Spring, Eject Lever	AA
				32	NBLTK0127AFZZ	Belt, Flywheel Drive	AC
				33	NBLTK0108AFZZ	Belt, Rewind Gear	AC
				34	NDAIR0130AFZZ	Turntable, Take-up	AF
				35	NDAIR0131AFZZ	Turntable, Supply	AF
				36	NFLYC0070AFZZ	Flywheel	AG
				37	NPLYR0062AFZZ	Ring Magnet	AE
				38	NROLP0057AFZZ	Gear, Play	AB
				39	NROLV0010AFZZ	Roller Assembly, Fast Forward	AF
				40	NROLX0010AFZZ	Gear Assembly, Rewind	AE
				41	NROLY0017AFZZ	Pinch Roller Assembly	AE
				42	PGIDM0065AFZZ	Cassette Guide (L)	AB
				43	PGIDM0066AFZZ	Cassette Guide (R)	AB
				44	PGUMM0111AF00	Cushion Rubber	AB
				45	RHEDF0054AFZZ	Head, Playback	AR
				46	RM07M0080AFZZ	Motor	AV
				47	RPLU-0076AFZZ	Solenoid	AL
				48	LX-WZ5012AGZZ	Washer	AA
				49	LX-WZ5018AGZZ	Washer	AA
				50	LX-WZ5020AGZZ	Washer	AA
				51	LX-WZ9057AFZZ	Spacer, Flywheel	AA
				52	LX-WZ9058AFZZ	Washer, Lock	AA
				53	QHWS-3206AGFN	Lug	AA
				54	QPWBF0747AFZZ	Printed Wiring Board, Mechanism Control	—
				55	QPWBF0756AFZZ	Printed Wiring Board, Lead Switch	—
				56	LHLDW3056AFZZ	Wire Holder	AA